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November 20, 1948

SCIENCE NEWS LETTER

TECHNOLOGY DEPARTMENT

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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Bright Comet

See Page 323

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VOL. 54 NO. 21

Making television history, first coverage of air-sea maneuvers demonstrates value of research by RCA Laboratories to our armed forces.

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MEDICINE

New Vitamin Discovered

Experiments with mice indicate that it increases the body's resistance to infection. This protective quality is believed to apply to man also.

➤ DISCOVERY of a new vitamin in wheat which increases natural resistance to infection, or germ-caused disease, was announced by Dr. Howard A. Schneider of the Rockefeller Institute for Medical Research, New York, at the meeting of the American Public Health Association in Boston.

Existence of this vitamin and its proved relation to disease resistance in mice goes far toward establishing the idea that being well nourished is a protection against germ-caused diseases. Well nourished takes on a special meaning in this connection, that of eating regularly a diet including the new vitamin.

The evidence so far is only for mice and their resistance to a naturally occurring disease of these animals, mouse typhoid, or Salmonellosis as scientists term it. But Dr. Schneider thinks it likely that what is true for mice will also in this case prove true for man.

The vitamin is believed to be a new one since tests showed none of the other known vitamins or other nutrients can replace it in the mouse diet with the same effect on disease resistance.

It occurs generally throughout the cereals and grasses as well as in wheat germ. Alfalfa contains it. Rockefeller scientists are now trying to isolate and identify it chemically.

The vitamin was discovered in an eight-year study of factors influencing the spread of infection among herds of mice. All kinds of diets of natural and synthetic foodstuffs were used, as well as virulent and non-virulent strains of the disease germs and mice of various hereditary strains.

Among mouse populations of mixed heredity, such as human populations have, the new vitamin increased resistance to mouse typhoid. But among inbred mouse populations with unmixed heredity, it did not matter what diet the mice ate. Their resistance to disease and the issue of their living or dying was found to be solely a matter of heredity.

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ASTRONOMY

Spot Bright New Comet

See Front Cover

➤ A BRIGHT new comet with enormous trailing tail was spotted Nov. 6 in the early morning sky. One of the brightest comets of our generation, it could be seen with the unaided eye an hour or so before sunrise low in the southeast.

Picked up in the constellation of Virgo, the virgin, the comet was far enough north to be seen, at least faintly, by most people in the United States. It was photographed with the 18-inch Schmidt camera at Palomar Observatory, Calif., and is shown on the cover of this week's SCIENCE NEWS LETTER. Henry L. Giclas of Lowell Observatory, Flagstaff, Ariz., and Dr. Dinsmore Alter, director of Griffith Observatory in Los Angeles, were among the first (Nov. 9) in this country to see the comet.

With a second magnitude nucleus, the comet was as bright as the stars forming the Big Dipper. It was thus brighter than Halley's comet in 1910, its most recent visit to the vicinity of the earth. Its tail was reported by some to extend 15 degrees across the sky, by others to cover 20 degrees. This means it was 30 to 40 times the diameter of the full moon.

The comet will undoubtedly go down in history as comet 1948 l, because not one man, but a large number of people discovered it independently. Its closeness to the sun prevented an earlier discovery of this brilliant object. The letter "l" denotes it is the 12th comet spotted this year.

First report of the comet to reach the United States was from Dr. J. S. Paraskevopoulos, superintendent of Harvard's South African station at Bloemfontein. He said the comet was spotted Nov. 7 ten degrees south of the bright star Spica.

A subsequent report from Australia showed the comet was discovered there on Nov. 6.

The comet was also found independently by Luis Rivera and Lauro Herrera, according to a later telegram from Director Luis Enrique Erro of the National Astrophysical Observatory, Tonanzintla, Mexico. It was also spotted by the Second Officer of the steamer Mendoza in the North Atlantic ocean.

Most enthusiastic reports from astronomers and amateurs in the United States reaching Harvard College Observatory, astronomical clearing house for the Western Hemisphere, were from those in the southern part of the country. There the comet could be picked up earlier in the morning than in the far north and thus seen with greater brilliance.

Science News Letter, November 20, 1948

SMOKE DETECTOR—Highly sensitive to smoke, one puff from the cigarette sets into operation the electronically-controlled smoke exhaust system.

ENGINEERING

Smoke Control System Cuts Panic Danger During Fire

➤ A COMBINATION electric-eye smoke detector and automatic exhaust system is designed to lessen danger from panics, or from toxic gases, in public buildings. This installation is in a department store.

The technique employed uses a Walter Kidde and Company smoke detector and a Westinghouse exhaust apparatus. The system for combatting smoke was installed in the Sage-Allen store, Hartford, Conn., to supplement the store's existing sprinkler equipment. Smoke spreads faster than fire and therefore is a bigger threat to a completely sprinklered building. Superheated, air and toxic gases from a fire passing to floors above may cause loss of life, and smoke may cause a panic.

Each floor of the building has an independent detection unit. Through six tiny inlets on each floor, continuous samples of air are drawn by a small fan in the basement. The electric eye, a photoelectric cell, in each unit will note even a slight amount of smoke present. It automatically activates the exhaust system, starting the exhaust fan, opens the collection duct damper on the floor where smoke is detected, closes all other floor dampers, and opens the fresh air intake.

To provide a controlled path for smoke removal, the system utilizes collection ducts surrounding the stair wells on the various floors. These ducts lead to an exhaust fan on the roof which can suck out 32,000 cubic feet of air a minute.

Science News Letter, November 20, 1948

TECHNOLOGY

Allies Reach Agreement

➤ THREE great nations, the United States, Canada and Britain, allies in two world wars and ready to stand together if another emergency arises, will have taken an important strategic and commercial step when their agreement to standardize threads of screws, nuts and bolts is signed this month.

The agreement has already been made. Representatives of the three nations met in Washington this month at the National Bureau of Standards to formalize it. When signed by them, it goes into immediate effect. One of the largest automobile manufacturers is reported ready to make the necessary changes the day of the signatures.

To many the standardization of screw threads may seem a minor matter. Without it, however, a British nut will not fit on an American bolt. With it an American driver of a British Austin car who loses a nut will not have to wait for a replacement from England. The same holds true for all types of machines built in one country and used in another. Standardization of screws, nuts and bolts is particularly important in aviation.

Important as the standardization is in peacetime, it is more important in war, particularly among nations who are fighting side by side. During the recent war millions of tons of precious steel went into bolts, nuts and screws, and great quantities were sent abroad to wherever American equipment was in use so that these war essentials could be kept in usable condition.

In America, the standard screw thread of today is made at an angle of 60 degrees, with a cross-section looking like the sharp teeth of a saw. In Britain, the thread has flat sides at an angle of 55 degrees to each other and with rounded tops and bottoms. The new agreement will establish several classes of screw threads with compromise dimensions which will enable the essential surfaces of corresponding classes to fit exactly.

This standardization step, which marks a definite turning point of the machine age, is the result of negotiations over the past 30 years or so which came to a real head during the war because of the wide use of American equipment by all the allies. The United States government took a very active part, but much of the success in reaching a conclusion is due to technical societies, particularly the Society of Automotive Engineers, the Society of Mechanical Engineers, and the American Standards Association.

Science News Letter, November 20, 1948

ENTOMOLOGY

Ship Insects From China's Redwoods to California

➤ FIRST SHIPMENTS of a collection of 60,000 insects from the Dawn Redwoods forest of China have been received at the California Academy of Sciences in San Francisco, Director Robert C. Miller announced. An entomological expedition headed by Dr. J. Linsley Gressitt and sponsored jointly by the Academy and Lingnan University, of Canton, is now at work among the Chinese redwoods, recently discovered alive after having been known only as a fossil species.

The collection will be studied with especial care to find what relationships, if any, can be found between the insects that live among the Chinese redwoods and those of the redwood forest of the California coast. Any such possible kinships or resemblances among the insects will be significant in working out the lines of descent of the existing redwoods from the redwoods of 50,000,000 years ago, whose vast forest circled the whole Northern Hemisphere.

It has already been learned that Metasequoia, the Chinese redwood, is limited to one valley, named Shui-Hsa-pa, in Hupeh province. About a thousand trees have thus far been counted. Along with them grow oaks, beeches, birch, linden and rhododendron, giving the forest a strong resemblance to woodland areas in the eastern United States.

Part of the insect collections will be retained by the Academy; the rest will be returned to Lingnan University.

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Photographs: Cover, Acme Telephoto; p. 323, Sage-Allen Store; p. 325, Westinghouse Electric Corp.; p. 327, General Electric Co.; p. 330, Fremont Davis; p. 331, Food and Agriculture Organization of the United Nations.

SCIENCE NEWS LETTER
Vol. 54 NOVEMBER 20, 1948 No. 21

57,800 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change, please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STAte 4439.

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PHYSICS

Atom Scientist Nobelist

Outstanding British physicist is honored for his research on cosmic radiation. His formulation connecting magnetism and gravitation was an important contribution.

➤ "FOR the discovery of a connection between magnetism and gravitation."

That might well be the citation of the 1948 Nobel Prize for physics awarded to Prof. P. M. S. Blackett, of Manchester University, one of Britain's outstanding physicists. Actually the award is reported to be "for discoveries in the field of cosmic radiation."

Last year Prof. Blackett presented to the Royal Society of London a mathematical relationship between electromagnetism and gravitation that arises out of the rotation of such massive bodies as the sun, earth and stars.

This formulation was hailed as possibly as significant as the Einstein relationship between mass and energy which was given such powerful reality by the atomic bomb. Like E equals mc^2, the Blackett formula has a cryptic appearance. In it there are: P, the strength of the magnetic field; beta, a constant near unity; G, the gravitational constant; c, the speed of light; and U, the angular momentum or spin of a revolving body.

In some laboratory at the present time an experimental test of this relationship may be under way, since Prof. Blackett proposed an experimental test. It would consist of revolving a large sphere quite rapidly and measuring its magnetic field.

Whether or not the Blackett formulation proves to be the basic connection between magnetism and gravitation, the earlier researches recognized by the Nobel award made important contributions to the understanding of the constitution of matter and radiation.

Prof. Blackett was one of the famous Cavendish Laboratory team of physicists that was led by the famous Rutherford. At Cambridge Prof. Blackett studied cosmic rays and found positive electrons (positrons) as well as ordinary electrons bursting out of cosmic ray showers. He was in the group that made positrons artificially. He estimated that the short-lived positrons were so plentiful that they must account for a thousandth part of the whole material universe. This was as early as 1933.

During the second world war, Prof. Blackett gave up tracking cosmic rays and atomic particles to work on Britain's early radar defense system and track Nazi planes instead. But he is back at his research now, famous and fifty, puzzling out more deep secrets of the universe.

Not all his time is spent on research, however. He is an "atom scientist," adviser to the British government on atomic energy. His book titled MILITARY AND POLITICAL CONSEQUENCES OF ATOMIC ENERGY, published in mid-October, says that Russia would be foolish to accept the proposals of the United States for the control of atomic energy. In his view, the dropping of the atomic bombs on Japan was actually the first act of the cold diplomatic war with Russia now in progress.

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CHEMISTRY

Swedish Chemist Nobelist

The winner of this year's prize gained his award for developing two methods of analysis that may lead to new advances in the field of biology.

➤ NEW ADVANCES in treating disease and understanding living things are likely to come from better knowledge of complex but minute chemical substances.

For new methods of separating, detecting and analyzing colloids, particularly the large molecules of proteins and other substances, the 1948 Nobel prize for chemistry was awarded to Prof. Arne Tiselius, of the Institute of Physical Chemistry, Upsala University, Sweden.

Working in the tradition of Prof. The Svedberg of the same university, who won the same prize in 1926, this year's Nobelist has developed two methods of analysis that are finding increasing use in investigational laboratories.

He applied electrophoresis to the separation of the heavy molecules of protein and other substances. He also worked out a new method of analysis based on adsorption and applied it to organic and biochemical problems.

The electrophoresis apparatus of Prof. Tiselius acts like a sorting machine for the separation of heavy molecules in solution. Prof. Svedberg is famous for his work on separating molecules and other substances of different weights by whirling them in the centrifuge. But sometimes the centrifuge method of separation can not be used.

Prof. Tiselius made an apparatus that takes advantage of the different electrical charges which protein particles possess to effect the separation. By placing a solution of such particles between electrodes and applying electrical voltage, it is possible to obtain a migration of the particles. Those with the greatest charge move the faster.

The trick of the Tiselius apparatus is to produce a current in the solution flowing against the motion of the particles. Usually the current flows just as fast, in one direction, as the slower of the migrating particles is moving in the other. These particles, therefore, are like a man on a treadmill who, though he walks swiftly, never really does anything but stay in one place.

Meanwhile the particles with the greater electrical charge are moving just a bit faster than the opposing current so that eventually they reach one end of the chamber and the separation has been effected. The Tiselius method has been used in several laboratories in the United States, particularly in connection with study of living tissues.

The method of adsorption analysis cited in the Nobel award makes it possible to separate and differentiate between proteins, acids, sugars, salts and other substances that

TINY ATOM-SMASHING MACHINE—This Westinghouse device is in reality a neutron counter which detects neutrons, vital building blocks in matter's structure which carry no electric charge. It is demonstrated by Dr. Kuan-Han Sun, Chinese-born Westinghouse research physicist. Containing a very small amount of uranium 235, it generates tiny atomic explosions to reveal the neutrons.

are of biological importance.

Adsorption is action of a substance holding another substance on its surface. It is aDsorption, not aBsorption, which is what a sponge or piece of blotting paper does to water.

In past years various kinds of adsorption methods have been used in organic chemistry and biochemistry. Willstatter and his followers used adsorption for the differentiation of various enzymes. Chromatographic analysis which is being applied widely is based on adsorption phenomena.

Prof. Tiselius may be said to have mechanized and made automatic the method of adsorption analysis.

Previous investigators had shown that the chromatography of colorless substances was possible in some cases by observations of the various layers in the column of material upon which the substances being investigated had collected. When the various substances gave a color, their detection was relatively simple. When they were colorless, it was sometimes possible to differentiate them by their fluorescence. Or the parts of the column could be tested with different specific reagents, either on the column directly or after it had been cut into sections and extracted.

Prof. Tiselius worked out a new and more general method. After passing through the column of adsorbent and before any mixing has taken place, the solution is allowed to flow through an arrangement for determining continuously the concentration by measuring some property of one of the chief substances passing through. This is done by connecting the outlet of the column to a small cell in which the refractive index, light absorption, conductivity or some other suitable property of the solution is observed continuously. The readings are plotted against the volume of flow. Apparatus that is self-registering and operates relatively automatically has been developed.

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Find Oil Off U. S. Coast

➤ LARGE petroleum accumulations exist under the American continental shelf and it is physically possible to get the oil from them, the American Petroleum Institute was told in Chicago by Mercer H. Parks and James C. Posgate of the Humble Oil and Refining Company.

Continental shelf petroleum production has passed the initial planning stage and as a result of successful drilling operations, at least two oil discoveries of possible major importance have been made, they said. These are both in the Gulf of Mexico.

Operations in open water encounter problems of the elements in addition to those usual on land. Auxiliary operations, such as transportation and drilling site preparation, they stated, become major items from technical and financial viewpoints.

The drilling sites now in use involve large platforms capable of supporting everything needed for drilling operations, as well as smaller platforms serviced by floating barges in a manner similar to that used in sheltered waters.

The two oil discoveries of possible major importance to which they referred are a producing well off Terrebonne Parish, La., of Kerr-McGee Oil Industries, Inc., and one drilled by the Humble Company off Jefferson Parish, La.

The first is a very shallow well, producing from a supercap sand through perforations about 1,750 feet deep. The Humble discovery came at a depth of about 8,650 feet in a second well drilled in the area. Until other wells are drilled, no proper evaluation can be made of the discovery, but the prospect is promising.

As generally understood, a continental shelf is the land mass lying submerged off the coast in less than some 600 feet of water. The United States continental shelf covers 750,000 square miles, of which 129,000 are in the Gulf of Mexico. This strip averages about 75 miles in width. It is in this Gulf shelf that oil men expect to find the best oil reserves.

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GEOLOGY

Find Ancient Seas Were Warmer than They Are Now

➤ A HUNDRED million years ago the sea water off the coast of western Europe was warmer than it is now, with temperatures ranging from 64 to 80 degrees Fahrenheit. Evidence pointing to this conclusion was obtained in a hitherto unused way by Prof. Harold C. Urey and associates at the Institute for Nuclear Studies at the University of Chicago, who presented their data at the meeting of the Geological Society of America in New York.

The Chicago scientists have discovered that the limy shells of sea animals contain a slightly higher percentage of heavy oxygen than is found in the dissolved limestone (calcium carbonate) in the surrounding sea water. The difference is less when the water is warm, greater when it is chilly.

Assuming that conditions in ancient seas were the same as they are today, Dr. Urey and his group analyzed fossils from the chalk deposits of England, laid down as sea-bottom ooze in upper Cretaceous time, about 100,000,000 years ago. The limy remains of squid-like mollusks known as Belemnites proved to be their best "paleothermometer," with readings as stated.

Fresh evidence that this continent had human inhabitants during the Pleistocene ice age has been found just south of the Scripps Institution of Oceanography at La Jolla, Calif., stated Dr. George F. Carter of the Johns Hopkins University. Here, in a river-deposited soil formation quite definitely of ice-age date, he found the charcoal of ancient fireplaces, stone tools, and shells left after the sea-food feasts of this long-gone people.

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MEDICINE

New Camera May Help Save Stomach Cancer Victims

➤ A NEW CAMERA which shows promise of saving victims of stomach ulcer by making mass X-ray detection studies possible was reported by Drs. John F. Roach, Robert D. Sloan and Russell H. Morgan, of Johns Hopkins Hospital, Baltimore, at the meeting of the Public Health Cancer Association in Boston.

Stomach cancer kills 60% of its 100,000 victims each year. The start of the disease is so insidious that there is no warning signal to attract either the patient's or his doctor's attention while the malignant growth is still in its early, curable stage.

The lens system of the camera uses reflection type optics. Its high speed makes it possible to get pictures for examination with one-twelfth the exposure to X-rays the patient would undergo with older equipment to get pictures giving the doctor the same amount of information for diagnosis.

The pictures are taken on 70-millimeter film and their low cost adds to their advantage as a mass stomach cancer detection method.

"A real reduction in the mortality of gastric cancer may be expected," the Hopkins doctors reported, if results with the camera during the first six months of a planned five-year study continue.

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GENERAL SCIENCE

British Rodman Medal Awarded to an American

➤ FOR THE FIRST time in its 13-year-old history, the British Rodman medal, awarded for outstanding work in photomicrography and related fields, is conferred upon an American. Harold F. Sherwood, of Kodak Research Laboratories in Rochester, N. Y., is the recipient. The award was made at the recent annual International Exhibition of the Royal Photographic Society held in London.

Mr. Sherwood exhibited microradiographs of thin sections of metal, wood and paper. Microradiography is a form of photography employing X-rays of low penetrating power. It is similar to medical and industrial radiography except that the X-rays used are of longer length. A typical microradiograph in his collection showed the depth of ink penetration in the paper of a postage stamp.

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CONSERVATION

U. S. Exceeds Soviet Plan

Russia's 15-year plan of conservation and land improvement has been more than matched in this country without need of an imposed, master-plan, expert says.

► RUSSIA'S ambitious program of soil conservation, irrigation and forest belt planting, to be carried out during the next 15 years, has already been more than matched in the United States, declares Dr. W. C. Lowdermilk, recently retired assistant director of the U. S. Soil Conservation Service. While not wishing to cast aspersions on the Soviet plans or to minimize their importance to the well-being of the Russian people, he considers it worth while to point out the record of accomplishment under the American system as a reply to the Kremlin's boast that a program such as theirs could not be put through under a capitalist economy.

Summarizing the recently published Soviet figures, Dr. Lowdermilk notes that their 15-year plan is to affect 300 million acres, with forest belts to be planted on 14 million acres, and 3,000 miles of long forest belts to protect cultivated land against winds blowing from desert areas. Grass and crop rotation systems are to be applied on 80 million collective farms, and 45 million reservoirs and ponds are to be constructed. Field-by-field conservation measures will be used on a total of 285 million acres.

Statistics of American land-use improvements which Dr. Lowdermilk has gathered from official sources do not exactly parallel the Russian figures, but many of the data are close enough to make comparisons interesting. There are, for example, 2,033 farm conservation districts, with a total of 1,114 million acres, of which more than 748 million acres lie within nearly four and one-half million farms and ranches. This movement is still spreading; 104 million acres in 207 new conservation districts were added in 1947.

Conservation surveys have been completed on farms with a total of more than 268 million acres, active plans for conservation are affecting nearly 158 million acres of farm and ranch lands, and conservation measures are being applied on 76 million acres. Wind and water erosion are being reduced by crop-residue management on well over 21 million acres, and by strip cropping on four million acres; 523,143 miles of terraces have been constructed. Range and pasture improvement methods have been put into use on nearly 47 million acres.

U. S. National Forests now cover 179 million acres; individual farmers are practicing woodland management on well over seven million acres of their own land. The U. S. Department of Agriculture has planted 33,650 miles of field windbreaks in the West, in addition to an unknown amount of planting by farmers on their own initiative.

Some 21 million acres of previously desert land have been brought under irrigation, partly by the U. S. Reclamation Service, but partly also by private corporations.

All this has not been achieved under a single master-plan imposed from above, Dr. Lowdermilk points out. Rather, government action has been taken by executives and scientists who followed the wishes of the people as expressed through their duly elected legislators.

Some of the accomplishments, though already great, are of recent origin. Interestingly enough, the Tennessee Valley Authority is now just 15 years old. Longest record of accomplishments is that of the U. S. Reclamation Service, which began its work 46 years ago, in 1902, some 15 years before the unprogressive czarist regime was ended in Russia.

Reason enough exists, Dr. Lowdermilk admits, for the relatively late start of large-scale land-use improvement in the USSR. Practically nothing was done under the Czars, and Russia has in the present century had to bear the brunt of three major wars. Nevertheless, he feels, it would have been in better taste if the Soviet authorities had been content to announce their own praiseworthy plans, without adding the claim that such things cannot be done in a land where more than what they plan for the future already stands as a record of present achievement.

Dr. Lowdermilk's views will be given in full in the forthcoming issue of the national conservation journal, THE LAND.

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GEOLOGY

Geologists Ponder Over Dinosaur-Like Imprint

► DID A DINOSAUR lie down in the mud, near the present site of West Coxsackie, N. Y., leaving the imprint of his scaly hide which was subsequently buried in silt and hardened into a permanent stony record? Or is there a less dramatic explanation for the marks?

At the meeting of the Geological Society of America in New York, Dr. George H. Chadwick, consulting geologist of Catskill, N. Y., called the attention of his colleagues to the peculiar "dinosaur leather" markings on a vertical rock surface by the roadside, about six feet wide and 30 feet long. He presented his observation as a challenge for investigation. It will be necessary to work fast, however, he said, since weathering will soon sponge out this puzzling record of the earth's dim past.

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ELECTRONICS

Electricity from Hair Sets Off Photo-Flash Tube

► THE CRACKLE of hair as combed by a girl has "electrical" value, a General Electric scientist said. The crackle is worth some 8,000 to 10,000 volts of potential electricity, he estimated.

The proof is that a GE photographer succeeded in making the crackle ionize a high-speed photo-tube, enabling a girl combing her hair to take a picture of herself engaged in the task.

In the method used, a metallic collector rod was attached to the comb employed. The rod was connected to the trigger electrodes of a photo-flash lamp. Each stroke of the girl's comb supplied the necessary 8,000 volts of power to set off the flash. The static electricity developed in combing the hair is low in comparison with that of scuffing the feet across a rug. In this latter case some 18,000 volts are generated, the scientist stated.

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"HAIR-POWER"—Each stroke with the comb generates 8,000 volts of potential electricity which in this picture was harnessed to the trigger of the photo-flash lamp. A single stroke through the hair set off the lamps, enabling the girl to take a picture of her friend and herself in this novel way.

ARCHAEOLOGY

Relics of Indian Culture Studied by Colombians

➤ REMAINS of a high Indian culture, rivalling the Mayan and Peruvian civilizations in its splendor, are being excavated and studied by archaeologists in Colombia, states Dr. Luis Duque Gomez, director of the Ethnological and Archaeological Institute at Bogota, now in this country on an exchange fellowship arranged by the State Department through the Smithsonian Institution.

Largest of these ancient cities is one now called Pueblito, near modern Santa Marta in northern Colombia. At this place there are stone foundations of more than 3,000 houses. It was inhabited until shortly before the Spaniards came to South America.

At San Agustin in southern Colombia is a huge cemetery, a "city of the dead" covering five square miles. It is filled with grotesque monuments, man-like in shape.

Like the Peruvian Indians and the Aztecs, these ancient inhabitants of Colombia had a corps of expert goldsmiths. Many of the gold objects found by the archaeologists, such as crowns, pendants and earrings, are of beautiful and delicate workmanship.

The government of Colombia has given these cites protection as national monuments, and is encouraging the training of young archaeologists. This work is under the direction of Dr. Duque.

Relatively few American archaeologists have done any work in the Colombian ruins, but Dr. Duque emphasizes that the cooperation of scientists from the United States will be welcomed, because there is so much to be done.

Science News Letter, November 20, 1948

METEOROLOGY

Rain-Maker Proposes Eliminating Lightning

➤ A RAIN-MAKER suggested the possibility of preventing lightning-caused forest fires by eliminating lightning itself.

The proposal comes from Dr. Vincent J. Schaefer of the General Electric Co., who developed the method, sometimes successful, of making rain or snow by scattering dry ice by airplane in clouds far above the earth.

The scheme for eliminating lightning, which he believes would be successful in certain areas under certain conditions, includes the transformation of towering cumulus clouds in the area to snow by the use of dry ice.

Thus, he said, instead of growing into highly unstable thunderstorms from which lightning is produced, the cumulus clouds either would precipitate out as snow and rain, or would become cirrus, or snow clouds, which do not produce lightning.

Dr. Schaefer's suggestions are included in a report of his summer's study of natural thunderstorm conditions, conducted at Priest River Forest Experiment Station, Idaho. In the general region of the station many hundreds of forest fires occur each year with an average of 1,100 caused by lightning.

The recommendation that dry ice, solid carbon dioxide, be used to transform the cumulus clouds was made to the U. S. Forest Service. Its Priest River Station is located in a region particularly well suited for such an experiment. The region has three "breeding" places for incipient thunderstorms. Due to local topographical features, these locations frequently cause highly-active towering cumulus clouds to develop. These often grow into thunderstorms.

Science News Letter, November 20, 1948

MEDICINE

Facial Paralysis Victims Respond to Treatment

➤ PATIENTS with facial paralysis, or Bell's palsy, do not have to sit around waiting for the paralyzed face muscles to recover while their doctor takes an "attitude of masterful expectancy." They can and should be treated, Dr. William Bierman, attending physical therapist at Mount Sinai Hospital, declared at the New York Academy of Medicine graduate fortnight.

He advocated the use of physical medicine such as early electrical stimulation of denervated muscles, but cautioned that massage of paralyzed muscles, especially in the face, should be very mild.

Voluntary exercise should be undertaken with great caution. In Bell's palsy, he explained, the healthy side of the face is stronger and since ordinarily the muscles of both sides of the face work together, the weak muscle on the paralyzed side is in danger of becoming stretched.

Science News Letter, November 20, 1948

AERONAUTICS

Supersonic Windtunnel Has Enclosed Airstream

➤ AN ENCLOSED airstream system which cleans and dries air for reuse has been installed in a small windtunnel at the University of Washington Aeronautical Laboratory in Seattle.

In a tiny opening two square inches, flying conditions at an altitude of 80,000 feet with a speed of 1,360 miles per hour are simulated. Modifications may give conditions up to an altitude of 200,000 feet at 2,000 miles per hour.

By using the enclosed slipstream, it is not necessary to continually remove moisture from outside air.

Although the actual test section is small, the complete unit, powered by four large vacuum pumps, is 20 feet long and four feet high.

Science News Letter, November 20, 1948

IN SCIEN

CHEMISTRY

Rubber and Plastic Make Tough, Light Material

➤ A NEW, TOUGH, lightweight material made of combinations of natural and synthetic rubber with plastic resins has been disclosed by the Goodyear Tire and Rubber Company.

Copolymer resins with a high styrene content are combined with natural or synthetic rubber in the group of materials which have been given the name Tuf-Lite. First applications include several types of sports equipment such as helmets for football or polo, golf club heads, golf ball covers and both bowling balls and pins. Other uses for the material include mildew-resistant carrying cases and containers, clicker pads, electrotype printing plates and other articles which need impact resistance and waterproof qualities.

Wide range of qualities, including colors, is possible with the resin-rubber blends, Goodyear scientists have discovered.

Science News Letter, November 20, 1948

MARINE BIOLOGY

Sponge Fishery May Help Economy of Philippines

➤ SPONGE FISHING may help the Philippine republic to build up its national economy, if preliminary promises of a survey being conducted for the Philippine government by the U. S. Fish and Wildlife Service are made good on a larger scale. Known sponging grounds in waters adjacent to the islands are chiefly in the Sulu and Celebes seas.

A minute beginning of a sponge-fishing industry was made in the Philippines before the war. There were two boats, carrying four divers and eight crewmen.

If sponges can be obtained on a large scale in the Philippines it will help the world as well as the islands themselves. Commercial sponge fishing is now confined to just two areas in the world: the Mediterranean sea and the Caribbean-Gulf region in the Western Hemisphere, and yields are falling off.

Estimated world production of sponges decreased from 2,450,000 pounds in 1938 to 860,000 pounds in 1947. The United States industry, confined to the west coast of Florida, yielded 606,000 pounds in 1938, and only 158,000 in 1947. Prices have increased so much, due to the scarcity of good sponges, that the small 1947 sponge crop brought nearly as much money as the four-times-larger 1938 yield.

Science News Letter, November 20, 1948

E FIELDS

PUBLIC HEALTH

No Need To Fear Atomic Bomb "Poisoned Water"

➤ YOU CAN TAKE one atomic bomb worry off your mind. That is fear of "poisoned water" after a bomb burst in or near the city water supply. If the city has a modern filtration plant, the water will be safe to drink.

That comes from Col. James P. Cooney, chief, special projects division, Office of the Surgeon General, Department of the Army. Said Col. Cooney at the meeting in Boston of the American Public Health Association:

"In case the water supply of a city is contaminated by fission products or unfissioned material from an atomic bomb, all the evidence on hand at present indicates that after passing through a modern filtration plant, the water at the tap would be safe to drink. More work will be done to prove or disprove this statement."

At the Bikini test water from evaporators used on the ship was found safe for drinking.

Other comforting facts presented by Col. Cooney: Immediately after a mid-air atomic bomb detonation it is perfectly safe to enter the area and rescue the thousands whose injuries will be such that they will not be able to walk. The residual radiation from an air burst atomic bomb is insignificant.

In case of an underwater or ground blast the radiation hazards would certainly be greater than from a mid-air burst but the blast and fire hazards would be proportionately decreased and, in Col. Cooney's opinion, the total number of casualties would be much less.

A large number of Japanese who had recovered from radiation sickness were examined and interviewed by Col. Cooney in August, 1946.

"They appeared perfectly normal and were handicapped in no way toward pursuing their way of living," he reported.

Science News Letter, November 20, 1948

INVENTION

New Electric Room Warmer Stores Heat in Soapstone

➤ AN ELECTRIC room warmer, that would come in handy now that evenings are growing chilly, has just been patented by Seymon Ria of Seattle. It is so built that it can store heat during daytime periods of off-peak loads, and release it when needed.

Heat storage is accomplished by means of cast blocks of soapstone—the same material that was employed in fireless cookers a generation ago, and as footwarmers in beds and buggies a generation before that. In Mr. Ria's invention the blocks are hollow, with flue-like openings running up the middle, and with the electric heating elements embedded in the cast stone itself.

To protect the floor from excessive heating, the soapstone blocks are set on cement-bound cast stone blocks of a different type, in which the light, porous type of volcanic ash known as scoria is the chief ingredient. Scoria slabs also enclose the soapstone heat-storage blocks, giving good insulation.

Thermostatically controlled doors at top and bottom are closed during the time when heat is being generated and stored in the soapstone blocks, and opened automatically by thermostatic controls when the room temperature calls for a little more heat. An electric blower may be used if desired to speed the distribution of the stored warmth.

This invention is protected by U. S. patent 2,450,561.

Science News Letter, November 20, 1948

MEDICINE

Scientific Tests Show Fido Has Tough Stomach

➤ FIDO has a tough stomach. Its lining resists permanent damage by agents varying from zinc chloride and tannic acid to ultrasonic waves.

Evidence for this resistant ability of the lining of the dog's stomach was reported by Drs. John Regis Miller, J. F. Herrick, Frank C. Mann, John H. Grindlay and James T. Priestly, of the Mayo Foundation, at the meeting of the American College of Surgeons in Los Angeles.

Better methods for fighting stomach ulcer and stomach cancer were the goal of the Mayo scientists' studies. For over a century, scientists have been trying to find methods for determining whether hot foods, spicy foods or other substances taken into the stomach can irritate it sufficiently to cause an ulcer or cancer.

Since it is difficult to see what goes on inside the stomach, the Mayo scientists first tried to transplant part of a dog's stomach with intact blood supply to the outside of its belly. This was achieved, the dogs being anesthetized with ether for the operation which was done with sterile technic. The dogs were "entirely comfortable" with the transplants of stomach lining, and further tests, the scientists reported, "caused them no detectable discomfort."

Besides zinc chloride and ultrasonic waves, the scientists tested the effects of tannic acid, sodium morrhuate, oil of peppermint, protamine, water soluble vitamin K, quinone, various pituitary gland preparations, the fever cabinet, microwave, diathermy and ultraviolet radiation. Although these agents produced changes in the transplanted stomach lining, the scientists found the lining of the dog's stomach "remarkably resistant to permanent alteration produced by these agents."

Science News Letter, November 20, 1948

ENGINEERING

Million Barrels Daily Is Aim for Oil from Coal

➤ SYNTHETIC OIL from coal, to the tune of 1,000,000 barrels daily, was given as the objective of a program outlined to the American Society of Mechanical Engineers in White Sulphur Springs, W. Va., by J. D. Doherty of the U. S. Bureau of Mines. The cost of production, he said, should be approximately 12.5 cents per gallon.

Describing work in research and development already under way by the Bureau of Mines and others in the production of synthetic oil, he called attention to the need for prompt erection of at least some commercial plants because synthetic liquid fuels are not going to do us much good in an emergency if we have to start from scratch.

A completely new and detailed estimate of the coal reserves of the United States is being made by the U. S. Geological Survey, the engineers were told by Paul Averitt of the Survey staff. It will take 10 years to complete.

The coal fields of the United States are large in all dimensions, he said. They cover roughly 350,000 square miles, or approximately one-ninth of the total area of the nation. The coal-bearing rocks commonly are several thousand feet thick and, as in West Virginia, contain as many as 117 named and correlated coal beds.

Science News Letter, November 20, 1948

ICHTHYOLOGY

Plow Seaweeds Under to Feed Fish in Malaya

➤ SEAWEEDS are "plowed under" to feed fish by peasant fishermen of Far Eastern shores, just as plants on land are plowed under as green manure in Western agriculture, D. W. LeMare of the Federation of Malaya and Singapore Fisheries Department has reported to the editor of NATURE (Oct. 30).

They have various ways of fertilizing their seaside fish ponds, which are usually formed by fencing off small arms of the sea. When the seaweeds become too thick for the fish—which do not want them for food—the peasants drain the pond, except for a small puddle at its bottom. Then they seine the fish out of this, to sell or eat.

In the Malayan region, they let the seaweed die and rot on the bottom, then spade it in as fertilizer. On the southern coast of China they haul it ashore and make it into compost heaps. This material is eventually returned to the ponds as fertilizer. On the shores of the Straits of Malacca, between Malaya and Sumatra, the peasants seine out myriads of tiny fish, useless for human food, and give them to pigs and ducks. Refuse from these animals' pens is used to fertilize the fish-producing water.

Science News Letter, November 20, 1948

AGRICULTURE

Thanksgiving for All

The food situation has improved all over the world. In America the harvest is the most bountiful since the Pilgrim Fothers landed.

By N. E. DODD

Director-General of the Food and Agriculture Organization of the United Nations.

An Oregon stock and grain farmer, Mr. Dodd came to his present position after serving as Undersecretary of Agriculture. In this article he describes how the scientific agriculture which keeps America well fed is being used to help peoples throughout the world solve their own food problems—and raise their own Thanksgiving feasts.

➤ NEVER in all the three centuries since the Pilgrim Fathers kept that first Thanksgiving Day on American soil has the annual harvest festival concluded such a fruitful season as that now coming to a close.

While we in the United States rejoice that we have enough and to spare, the rest of the world joins us. For, although harvests elsewhere are more bountiful than they have been in recent years, the world still needs the mighty production of America to help feed the hungry millions.

In fact, the world will always need to draw upon this continent for our extra production—production that arises not only from a fruitful soil, but from the application to agriculture of advanced scientific technology.

It is, I think, cause for thanksgiving even greater than the bountiful harvest that the nations of the world have joined to share their knowledge of production and distribution in common action through FAO. In this fact lies the seed of more bountiful future harvests everywhere, with a gradual rise in the health and well-being of all mankind.

Renewed Mankind's Hopes

This year of generally good crops has unquestionably renewed mankind's hopes for the future, and so has relieved at least some of the fears and tensions which have made the world so uneasy since the war. Like the Pilgrim Fathers of Plymouth Colony with their good crops after that first bleak winter, the world has strength and hope to rebuild, to plan anew for peace and prosperity.

This year's 3,500,000,000-bushel corn crop will be the largest in United States history. Wheat will be only some six percent below the 1,365,000,000 bushel record crop of 1947, and 36% above the 1937-46 average. The oats crop is the third largest in the country's history. Grain sorghum production will be 28% and soybean production 53% above 1937-46 averages.

During the last two years (1946-47 and 1947-48) the United States exported about one-half of the bread grains that went into the world market and this comprised about a third of the total production of bread grains in the United States.

In spite of great effort and substantial progress, European production still falls short of normal requirements, with net production of food some 26% below prewar. Only Sweden, Switzerland and Britain have succeeded since the war in bringing their volume of food production above the prewar levels. Not only the destruction and disorganization of the war, but unfavorable weather in the two seasons preceding 1948 have contributed to the shortfall of European production.

In the Far East, the 1948 harvests are above those of 1947 but still below prewar production except in Siam, the Philippines, India and Pakistan, where they only slightly exceed prewar averages. But the Far East as a whole is not meeting its own needs. Before the war, the region was a net exporter of important staple foodstuffs; since the war it has been a net importer, thus placing additional demands upon traditional exporting countries.

Food Situation Improved

Elsewhere in the world—in the Near East and on the African continent, in the Soviet Union, Oceania and Latin America—the food situation is definitely improved over that of the previous year and in most places over the prewar years.

But even such good harvest and the progress made so far is not good enough. Even before the war, millions of people were not adequately fed. In the last ten years, population has grown by 200 million—roughly the equivalent of the North American continent's population. Every morning there are 55,000 more people for breakfast than there were the morning before, and production does not yet match this rate of rise in population.

This is why there is great cause for thanksgiving that the peoples of the world are showing such willingness to work together to increase production and improve distribution of the products of the soil and the waters.

For the last ten days, the Conference of FAO has been holding its Fourth Annual Session in Washington. This world food parliament of 57 nations—the largest international gathering ever held in Washington—is reviewing the state of food and agriculture in the world. It is studying the programs of the member nations in their efforts to improve the situation, and endeavoring to integrate these programs better. It is reviewing the progress made to date and the needs which remain. It is planning further action, both national and international, through FAO.

These plans of work include such broad intergovernmental action as continuing the system of international allocation of scarce foodstuffs until total supplies are more adequate. They include, likewise, such fundamental workaday jobs as spreading the use of hybrid corn seed, immunizing cattle against rinderpest, and ratproofing and fumigating grain storage. In all of these, national action has been aided by FAO.

Hybrid Seed Corn

North American hybrid seed corn has been introduced into Europe and schools held on corn breeding. If the 20% increase in production attributed to hybrid corn in North America can be achieved in Europe, the increase in production there would equal a third of that continent's needs of imported coarse grains to rebuild its livestock production.

In China alone, a million cows and buffaloes a year are killed by rinderpest. These animals not only produce milk and meat, but draw rice farmers' plows. Mass production of avianized vaccine in China will make it possible to immunize 15 million animals south of the Yangtze river in a project now under way.

TWO FARMERS TALK CORN—Director-General Norris E. Dodd of FAO examines a sample of the world's hugest corn crop on the farm of J. J. Hutton, near Brookville, Md.

PRIMITIVE FARMING—This Korean farmer is his own beast of burden. Such inefficient farming methods need to give way to more modern ones, in order to abate the world's hunger.

The toll of stored bread grains and rice taken by rats, insects and fungi has been estimated as equalling the amount of world trade in grains. Saving even a small percentage of the present loss would help to close the gap between the grain available and the grain needed to feed the world better.

The harvest of scientific research, like the harvest of the earth itself, is being put to work for the universal well-being of mankind.

Science News Letter, November 20, 1948

ARCHAEOLOGY

Ruins of Pagan Temple

► COLOGNE CATHEDRAL, Germany's most magnificent place of Christian worship, stands on a site devoted in pre-Christian times to the service of the pagan gods and goddesses of Rome. A discovery made during the war, when a bombproof shelter was being dug near the cathedral, appears to be the remains of a structure dedicated to Dionysos, the ancient Greco-Roman wine-god. Details of the find are given by Dr. Ernstwilhelm Gerster, of the Roman-German Museum of Cologne, in the scientific journal, FORSCHUNGEN UND FORTSCHRITTE (April).

When the diggers of the bomb shelter first found the buried ruins, they were thought to be the remains of a palace—possibly the Roman governor's dwelling. The building had been large, with over-all dimensions of approximately 270 by 330 feet. There were many rooms, but the center of interest proved to be a hall about 23 by 33 feet, apparently used for feasting.

This room had an elaborate mosaic floor, with six large pictorial panels and many smaller designs. The smaller mosaics depict good things to eat: fat ducks, peacocks, turtles, oysters, baskets of fruit. One of the larger pictures is of Cupid riding on a lion. The other five depict a satyr and a maenad — male and female followers of Dionysos—in successive stages of the wild ecstatic dance that featured the worship of the god.

It is known that Dionysos-worship involved festivities of a kind that early Christians regarded simply as orgies, so that decorations that might seem more appropriate to a Roman night club would not be at all out of place in the wine-god's house. And since grape-culture and wine-making were brought to the Rhine valley by the Romans, a great temple to Dionysos would be definitely appropriate in the city they built on the river.

Science News Letter, November 20, 1948

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Do You Know?

Good *lipstick*, because often in close touch with food, is made to the same standards of purity.

Glutamic acid, used in food-flavoring and in medicines, is a by-product of beet-sugar manufacturing.

Automobiles should be driven slowly in cold weather until the engine is heated to normal operating temperature.

Approximately half the *gas* used in homes and other places in a Pennsylvania coke-making town is by-product gas from local coke ovens.

Grasshopper and cricket eggs are laid during late summer and remain in the soil until spring when they hatch and the insects emerge.

Although Australia produces nearly 2,500,000 pounds of *hops* each year, it does not grow enough to meet the needs of its domestic breweries.

A Salvadorian government agency is planning to mount some of its employees; it has asked for bids on 50 American *bicycles*.

One kind of horse is a well-known animal, but in a steel mill a *horse* is a chunk of iron which solidifies in the bottom of a blast furnace.

An early *match* was made with wood sticks coated with a mixture of potassium chlorate and sugar and tipped with sulfur; it was ignited by sticking it into shredded asbestos impregnated with concentrated sulfuric acid.

MEDICINE

Vaccine Hits Women More

➤ INFLUENZA VACCINE produces a more severe reaction in women than in men, the 76th annual meeting of the American Public Health Association was told in Boston.

Absenteeism among inoculated women was four times higher than in men, a study of 4,217 workers at the Prudential Insurance Co., Newark, N. J., revealed. Dr. Joseph F. Sadusk of the Research and Development Board, National Military Establishment, Washington, D. C., directed the study with the assistance of Prudential's researchers, Preston C. Bassett and John S. Meddaugh.

"These reactions," Dr. Sadusk points out, "should not prove a deterrent to vaccination of industrial populations since they are mild and the degree of absenteeism is low."

Infants and children can be protected from the ill effects following influenza vaccine injections if they are inoculated with small amounts of vaccine over short intervals of time, another research team reported to the meeting.

"Reactions to influenza virus vaccine administered to infants and children are due in most instances to the amount of virus in the vaccine," they discovered in their study made at the Sarah Fisher Home, Farmington, Mich. The tests were made on 93 children whose average age was 3.2 years, according to Dr. J. J. Quilligan, Jr., Dr. Thomas Francis, Jr., and Elva Minuse, of the University of Michigan.

A new strain of virus is claimed to be responsible for California's two influenza epidemics during the past two years by Dr. George Meiklejohn, of the State's Viral and Rickettsial Disease Laboratory, Department of Health in Berkeley.

He said the population had little resistance and vaccines had little effect on this strain which showed a sharp difference from Type A influenza strains isolated in 1943 and in earlier years.

Influenza virus was found in the throats of a group of boys more than a month before an epidemic broke out and during the epidemic. During the 32 days they harbored the flu virus they showed no symptoms of the disease, Dr. R. M. Taylor, director of the International Health Division Laboratories of the Rockefeller Foundation, pointed out.

Some 800 boys between 17 and 21 years were subjects of the survey made in a state vocational school. Subsequently there were 32 cases of flu.

No significant difference in the attack rate of the disease was noted among those who were inoculated with either commercial A or B type mixed vaccine and the unvaccinated, Dr. Taylor said.

Data on an Army post which was vaccinated against flu virus with two vaccines, one incorporating a new strain, were presented to the meeting by Dr. James E. Salk of the University of Pittsburgh School of Medicine, and Capt. Philip C. Suriano, M. C., Fort Dix, N. J.

Fewer individuals were admitted to the hospital for respiratory disease from the group given the new vaccine, they found.

Science News Letter, November 20, 1948

PHYSICS

Nitrous Oxide May Be In Whole World's Atmosphere

➤ NITROUS OXIDE, familiarly called "laughing gas," is probably present throughout the whole world's atmosphere. At least scientists have just learned that there's about as much of it in the atmosphere above England as there is above the United States.

Existence of the gas nitrous oxide in the earth's atmosphere in sufficient quantity to record itself on spectrum photographs of the sun's rays passing through the earth's atmosphere was established several years ago by Dr. Arthur Adel of the Randall Laboratory of Physics, University of Michigan. Now J. H. Shaw, Dr. G. B. B. M. Sutherland and T. W. Wormell, all of the Solar Physics Observatory in Cambridge, England, have shown that about as much exists in the atmosphere above that observatory as was found in America.

Just how high above the earth's surface the majority of this gas is concentrated has not yet been determined. If most of it is in the upper atmosphere, this layer may be largely responsible for keeping the temperature of the lower atmosphere fairly uniform, the physicists report in the American Physical Society journal, PHYSICAL REVIEW (Oct. 15).

Science News Letter, November 20, 1948

★ ASTRONOMICAL PHOTOGRAPHS

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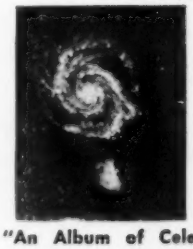

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ASTRONOMY-PHYSICS

Rocket Space Ship

➤ WHEN rocket ships fly out into space beyond the earth, they will not be in great danger of being hit by the missiles from outer space that are called meteorites.

Anticipating space ships or artificial "moons" that circle the earth as satellites, G. Grimminger, Douglas Aircraft Co. scientist, has investigated what would happen if rockets were launched to travel above the earth's atmosphere.

Skin covering for a space craft of stainless steel or duraluminum need be no thicker than that presently used in high-speed aircraft in order to withstand the hail of cosmic dust that can be expected above the earth's atmosphere. The most frequent meteorites are the tiniest. Some are so small that they barely escape being whisked out beyond the solar system by the pressure of the sun's radiation. A rocket ship can expect to meet these smallest sub-microscopic motes about once every second, but with no more effect than to receive a tiny blemish on its polished hull.

The larger the cosmic fragment, the rarer it will be. Mr. Grimminger's calculations show that any meteoritic particle large enough to puncture a stainless steel hull a twentieth of an inch thick would be so rare as to be encountered by a rocket ship on the average of only once in 15 years of flight. Even then, the penetrating fragment would be very tiny, having about the diameter of the shaft of an ordinary pin. A pin-hole puncture would result, but there is a good chance that it could be located and patched.

It would be an almost inconceivable rarity for a rocket ship to meet a meteorite of the size that we usually imagine, such as the diameter of a baseball or even greater.

From Mr. Grimminger's study, it can be concluded that until present rocket engines and their explosive fuels are made much safer and until someone devises a safe technique for landing a rocket craft, the hazards from meteorites will be the least of the worries of high-flying astronauts.

The investigation was reported to the American Institute of Physics' JOURNAL OF APPLIED PHYSICS (Oct.).

Science News Letter, November 20, 1948

CHEMISTRY

Hints on Laundering

➤ IF THE WATER in your locality is fairly soft, be sure to use soap rather than synthetic detergents in laundering. Where the water is hard, synthetic detergents in most cases will clean your clothes better than soaps, particularly when only a small amount is to be used.

Both soap and synthetic detergent clean your cottons better, irrespective of the hardness of the water, if you heat the water to about 140 degrees Fahrenheit.

This is the practical advice given to members of the American Association of Textile Chemists and Colorists meeting in Augusta, Ga., by Miss Margaret S. Furry, Division of Textiles and Clothing of the U. S. Department of Agriculture.

Laundering tests leading to these results were conducted by Miss Furry, Dr. Verda I. McLendon and Miss Mary E. Aler at the Department of Agriculture in an attempt to help homemakers get the best results from home laundering of clothing and household fabrics. Soaps and synthetic detergents now on the market were tested for their ability to remove soil under conditions similar to those used in millions of homes throughout the country on wash day. Fifteen soaps, one soap powder and 35 synthetic detergents, chosen to represent the various classes now commercially available, were examined.

First, strips of bleached percale sheeting were artificially soiled in a mixture of graphite, tallow and mineral oil, then dried. These were laundered for 15 minutes in the launder-ometer, in waters heated to both 105 and 140 degrees Fahrenheit. Both distilled water and water of two degrees of hardness were used. To discover how much detergent must be used for maximum cleanliness, five different concentrations were employed.

Only three soaps and five detergents, representative of the various classes, were employed for the more detailed tests. The other detergents were evaluated at one temperature and one concentration only in both distilled and hard water.

The non-ionic synthetics were found the most efficient of the synthetic detergents tested in removing soil. In distilled water they were quite as effective as the standard soap. The cationic synthetic detergents were the least effective. In distilled water they were only about a quarter as efficient as the standard soap.

Science News Letter, November 20, 1948

ENGINEERING

Wasted Airplane Exhaust Will Add Jet-Propulsion

➤ WASTED ENERGY in the exhaust gases of an airplane engine is to be put to work in a new engine under development for the U. S. Air Force. The new engine will deliver some 4,000 horsepower to a propeller as well as several hundred pounds of jet thrust.

This piston-jet propulsion combination consists of a 28-cylinder Pratt and Whitney Wasp Major engine with a General Electric two-stage turbosupercharger which utilizes the engine's hot exhaust gases in two ways.

The turbosupercharger first uses the gases' energy to supercharge all combustion air required by the engine. It then discharges the gases to the rear through an orifice, the size of which is varied to obtain the best division of exhaust energy between supercharging and jet thrust.

This new combination powerplant, which will be known as the Wasp-Major-VDT, will be used first on the Air Force's Boeing B-54, an extended development of the famous B-29 and of the newer B-50. It is expected to enable heavy, long-range aircraft to fly farther, faster and higher. It will enable planes to take off with heavier loads of cargo, fuel or bombs, and to climb more rapidly. The VDT, by saving formerly wasted energy, is a fuel economizer. The new combination engine is already undergoing flight tests.

Science News Letter, November 20, 1948

Scientists are attempting to develop a *sugarcane* for America that will shed its lower leaves and leaf sheaths so that machine harvesting can be speeded up; they are crossing an American cane with a Burma variety that has this property.

Over-dried *popcorn* will not pop well.

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Books of the Week

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BIRTHDAYS DON'T COUNT—*New York State Joint Legislative Committee on Problems of the Aging*, 326 p., illus., paper, free upon request direct to publisher, 94 Broadway, Newburgh, New York. Authorities discuss multiple social, psychological and medical problems of the increasing number of old people.

COMMERCIAL PHOTOGRAPHIC LIGHTINGS—Charles Abel — *Greenberg*, 272 p., illus., $7.50. A beautiful book for either professional or amateur photographer generously illustrated with photographs for which technical data are provided.

CYBERNETICS: Or Control and Communication in the Animal and the Machine — Norbert Wiener—*Wiley*, 194 p., $3.00. This work developed from a new trend toward study of problems cutting across the various disciplines of science. Dr. Wiener has selected the problem of manipulation of information and communication whether it be between persons or groups, within the nervous system, or in the world of machines. Of interest to all those having to do with scientific method.

DICTIONARY OF GENETICS: Including Terms Used in Cytology, Animal Breeding and Evolution—R. L. Knight—*Chronica Botanica*, 183 p., $4.50. The author hopes that writers will not continue to coin new terms when one of those listed here would serve the purpose.

THE DRUGS YOU USE—Austin Smith—*Revere*, 243 p., $3.00. Telling the patient in non-technical style about what the doctor prescribes and why.

THE FERNS OF MAINE—Edith Bolan Ogden—*University Press*, 128 p., illus., paper, $1.00. Describing 19 genera divided into 99 entities.

HEALTH INSTRUCTION YEARBOOK 1948—Oliver E. Byrd—*Stanford University Press*, 320 p., $3.50. A condensation of 321 articles on health. Surprisingly, one of the most important sources was the Congressional Record.

LEARNING AND WORLD PEACE: Eighth Symposium — Lyman Bryson, Louis Finkelstein and R. M. Maciver, Eds. — *Conference on Science, Philosophy and Religion (Harper)*, 694 p., $6.50. Answers by specialists in diverse fields to the question, "How can scholarship contribute to the relief of international tensions?"

ONWARD MOTIVES IN RESEARCH — Edward R. Weidlein—*Mellon Institute of Industrial Research*, 7 p., illus., paper, free on request direct to publisher, University of Pittsburgh, Pittsburgh 13, Pa. The Priestley Medal Address.

RADAR PRIMER—J. L. Hornung—*McGraw-Hill*, 218 p., illus., $2.80. Interesting reading for the layman, but containing all the facts necessary for a text on radar. The author was formerly in charge of the radar school at MIT.

UNDERSTAND YOUR CHILD — FROM 6 TO 12—Clara Lambert—*Public Affairs Committee*, 32 p., illus., paper, 20 cents. Helpful information and advice for parent and teachers.

Science News Letter, November 20, 1948

AGRICULTURE

Negeb Has Good Soil

▶ THE NEGEB, disputed arid southern end of Palestine, could support five times its present population of 50,000 if properly irrigated and scientifically farmed. So declared Dr. W. C. Lowdermilk, formerly of the U. S. Soil Conservation Service, who has just returned from a long stay abroad, during which he spent several months studying conditions in the Mediterranean region.

A considerable part of the soil in the Negeb, he stated, is of the fine-grained type known as loess, similar to the fabulously productive corn-land of western Iowa. Only it doesn't get enough water on it. Annual rainfall at Beersheba, traditionally the southernmost town in ancient Israel, is only eight inches. A little to the northwest, at Gaza, where Samson met Delilah and other troubles, it is 14 inches.

Here and there, unhappy Arabs carry on "patch farming" on favorable spots, but for the most part the nomad population makes a living (such as it is) by pasturing sheep and goats. Goats are the damnation of a land, in Dr. Lowdermilk's opinion. They begin where the sheep leave off, and where they leave off no other animal can find a mouthful. Then drought claims the country, plus fierce erosion when the occasional cloudbursts come.

By diverting water from the Jordan river into irrigation canals, Dr. Lowdermilk said, 80,000 acres of this stripped and barren land could be made fruitful again. To this another 100,000 acres could be added if water from the Litani river in Lebanon were turned into the Jordan through a four-mile tunnel under the mountains. This would also provide hydroelectric power for use in Lebanon.

South of Beersheba, he continued, there is a strip of country suitable for dry farming. By careful use of dust-mulching methods, it can be made to yield a crop of barley every other year. Beyond this dry-farming area, grazing can be continued.

Another possibility, he suggested, would be the cultivation of natural desert plants from which a profit can be made, like guayule for rubber.

The Negeb has seen more prosperous days, Dr. Lowdermilk stated. It was a well-cultivated country when it was part of the Byzantine Empire. When he was there on an earlier trip, he flew over much of it in a plane, and could see the lines of old irrigation canals and the sites of old dams, that kept the land watered in the fifth and sixth centuries A. D. He could even see where accumulated silt had been cleared out from above the dams, and piled on shore.

Then the power of Byzantium began to crumble before the onset of the new power of Islam. Mohammed's followers, like the Prophet himself, were herdsmen, not farmers. They let the irrigation system go to ruin, and they devoured the land with the unsparing teeth of their sheep, goats and camels. So the Negeb sank to its present low state, where it will stay until modern engineering brings it the waters of salvation.

Science News Letter, November 20, 1948

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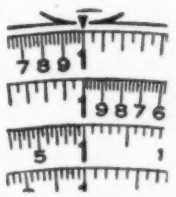

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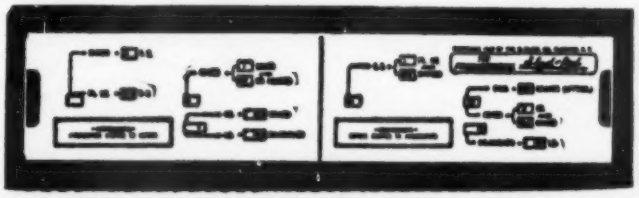

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FASTENER for farm gates or dog kennels, safe from chance opening by the animals themselves, is a metal bar six to 12 inches long with a hole at one end for a holding staple and a hinged hook-like device at the other to fit into another staple. To open, this hook must be lifted by the fingers.

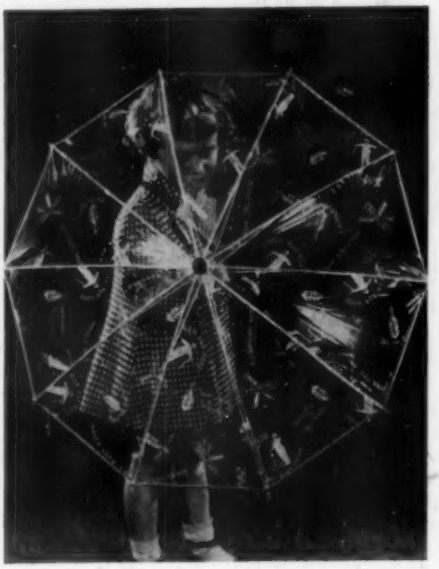
Science News Letter, November 20, 1948

PACKAGING MACHINE, probably the world's largest, automatically wraps stacks of a half-dozen sheets of insulating wallboard four feet wide and ten feet long at a rate of two packages a minute. With it, two men will do the work that requires 16 by hand methods.

Science News Letter, November 20, 1948

FREE-FALL CONTAINER, to drop supplies from an airplane, has hinged wings on two sides which open by air pressure at the beginning of the descent. They are so placed that they cause the box-like container of this recently patented device to rotate as it falls, decreasing its speed sufficiently so that it hits the ground with very little force.

Science News Letter, November 20, 1948



TRANSPARENT UMBRELLA, shown in the picture, provides safety from showers and also safety from traffic. This child-sized protector, with a clear, durable plastic top, is fun to carry because on it are printed in red or green pictures of policemen and safety mottoes.

Science News Letter, November 20, 1948

COCKTAIL SHAKER, bottle-shaped and made of stainless steel, has a cylindrical lower section to hold the liquor and ice, and an overfitting top section the shape of a bottle neck. The shaker is large enough to hold an unopened bottle of liquor to protect it from breakage in traveling.

Science News Letter, November 20, 1948

PLASTIC TRAY, which fits into a drawer of a woman's vanity or dressing table, has compartments divided in such a way that there is a place for each article used. Nail files, orange sticks, combs, brushes, powder puff and powder can be neatly stored and easily reached when wanted.

Science News Letter, November 20, 1948

FOLDING SKI, recently patented, comprises a front and a rear section, both of which can be moved in and out of an interlocking engagement, and a hinge member including a hinge plate rigidly secured to one ski section. A guide plate has one end hinged to the hinge plate.

Science News Letter, November 20, 1948

• Nature Ramblings *by Frank Thone* •

THANKSGIVING Day posters, magazine covers and other popular art almost always show a stalwart-looking Pilgrim Father carrying a bell-muzzled gun and a big turkey-gobbler, with maybe a very pretty Priscilla in the background. It's a nice picture; the only thing the matter with it is that it isn't accurate.

That bell-mouthed firearm, for one thing, isn't an early seventeenth-century fowling-piece. It is a blunderbuss, a "scatter-gun" type of weapon used in its day very much as the sawed-off shotgun was used in Wild West days—as a defensive arm carried by stagecoach guards for the discouragement of highwaymen. It is not even certain that the Pilgrims knew what a blunderbuss was; its first known mention in English print was in 1654, which was 23 years after the first Thanksgiving Day.

The turkey shown in the picture usually looks altogether too much like the domestic birds we commonly see in farmyard and

Thanksgiving Anachronisms

market. True enough, our domestic turkey is a native of the Western Hemisphere, and is closely related to the wild turkeys the early English settlers hunted in the woods, but it is not the same species. There is a strong resemblance between domestic and wild turkeys, but the wild turkey has light brown or chestnut tips to its tail-feathers, instead of white. Also, present-day domestic turkeys are usually larger than the wild ones.

The history of our familiar Thanksgiving bird is a strange one. The early Spanish voyagers and conquerors found, among the very few domestic animals kept by the natives of Mexico and Central America, this very meaty and desirable fowl. They took some back to Europe, where they were presently all around the Mediterranean basin. Thence they worked their way westward again, largely by way of the Danube valley, bearing with them the misnomer that they have never got rid of, falsely ascribing them to a Turkish origin. Finally, from England they were carried back across the Atlantic, to the North American colonies. It is the same story, essentially, as that of the white potato, that frequently flanks the turkey on our Thanksgiving tables.

Science News Letter, November 20, 1948